ST-S415

SERVICE MANUAL

AEP Model

SPECIFICATIONS

FM tuner

Frequency range	87.5 - 108 MHz (50 kHz step)	
* Frequency range	FM 1: 65 - 74 MHz FM 2: 87.5 - 108 MHz	
Antenna terminals	75 Ω unbalanced	
Intermediate frequency	10.7 MHz	
Sensitivity	(mono S/N 26 dB) 10.3 dBf, 0.9 µV/75 Ω (stereo S/N 46 dB) 38.5 dBf, 23 µV/75 Ω	
Usable sensitivity	10.3 dBf, 0.9 µV/75 Ω (IHF)	
Signal-to-noise ratio	(at 40 kHz deviation) 80 dB (mono) 76 dB (stereo)	
Harmonic distortion	WIDE	0.04% (mono); 0.05% (stereo) (at 1 kHz)
	NARROW	0.06% (mono); 0.08% (stereo)
Frequency response	30 Hz - 15 kHz (+0.5 dB, –2.0 dB)	
Separation	50 dB (at 1 kHz)	
Selectivity	WIDE	80 dB (at 400 kHz)
	NARROW	90 dB (at 400 kHz)
	WIDE	45 dB (at 300 kHz)
	NARROW	70 dB (at 300 kHz)
Output/impedance	600 mV/470 Ω (at 40 kHz deviation)	

AM tuner

Frequency range	MW: 531 - 1,602 kHz (9 kHz step) LW: 153 - 279 kHz (1 kHz step)
Intermediate frequency	450 kHz
Usable sensitivity	(with AM loop antenna) MW: 300 µV/m (999 kHz) LW: 1 mV/m (216 kHz)
Signal-to-noise ratio	54 dB
Harmonic distortion	0.3%
Selectivity	32 dB

General

Power requirements	220 - 230 V AC, 50/60 Hz
Power consumption	12 W
Dimensions	Approx. 430 mm (W) x 85 mm (H) x 295 mm (D) (17 x $3^{3}/_{8}$ x $11^{3}/_{8}$ inches)
Mass	Approx. 2.9 kg (6 lb. 3 oz.)
Accessories supplied	Connecting cord (1) AM loop antenna (1) FM wire antenna (1) EON connecting cord (1)

Design and specifications are subject to change without notice.

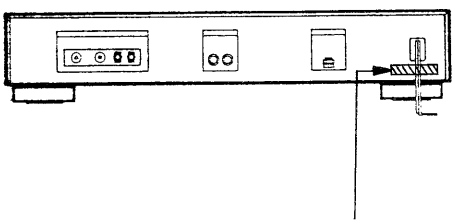
* The specifications of FM tuner except the frequency range are measured in the FM 2 mode.

FM STEREO FM-AM TUNER

SONY®

MODEL IDENTIFICATION

— BACK PANEL —



4-965-470-6□ (Italian, East European model)
4-965-470-7□ (AEP model)
4-965-470-8□ (German model)

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Notes on chip component replacement

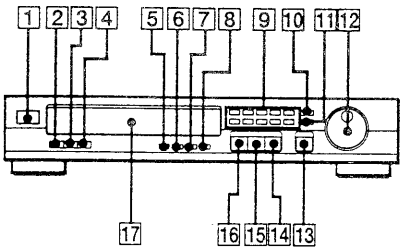
- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SECTION 1
GENERAL

This section is extracted from instruction manual.



Front Panel

1 Power switch (14)

2 EON TA button (66)

3 EON NEWS/INFO button (66)

4 DISPLAY button (52, 64)

5 ANT button (34)

6 FM MODE button (30)

7 BAND button (24, 26, 28)

8 MEMORY/NEXT button (44, 50)

9 Preset buttons (28, 44, 48)

10 TUNE MODE button (24, 26, 48)

11 SHIFT button (44, 48)

12 TUNING/SELECT knob (16, 20, 22, 24, 26, 32, 34, 36, 38, 40, 48, 50, 54, 70, 72)

13 DIRECT button (28)

14 ENTER button (16, 20, 22, 32, 34, 36, 38, 40, 42, 50, 54, 70, 72)

15 RETURN button (16, 38, 42)

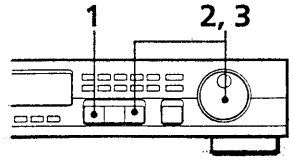
16 MENU button (16, 20, 22, 32, 36, 38, 40, 42, 50, 54, 70, 72)

17 Display window

(The numbers in parentheses indicate the page(s) where the control is described.)

Preset Tuning

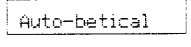
This section shows you how to store and automatically tune in your favorite stations. Each station stored for preset tuning is first assigned a two-character code, consisting of a letter (A-C) followed by a one-digit number (0-9). To tune in a stored station, you simply enter the appropriate two-character code. You can store up to 30 stations



1

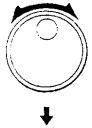
2

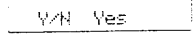
TUNING/SELECT



3

TUNING/SELECT





Preset Tuning

Storing Stations Using "Auto-betical select"

"Auto-betical select" is the easiest way to automatically store all FM RDS and FM stations in your broadcast area. The tuner first selects FM RDS stations with the clearest RDS signal from among the FM RDS stations broadcasting the same program and stores them in alphabetical order without redundancy up to 30 stations. Then the tuner stores FM stations other than the FM RDS stations from low to high frequencies. If you want to store FM and MW/LW stations one by one, do the procedure on page 44.

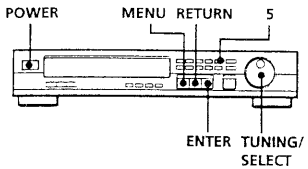
1 Press MENU.

2 Rotate the TUNING/SELECT knob until "Auto-betical" appears and then press ENTER.

3 Rotate the TUNING/SELECT knob until "Y/N YES" appears and then press ENTER.
The tuner scans and stores all FM RDS and FM stations in the broadcast area. For RDS stations, the tuner first checks for stations broadcasting the same program, then stores only the one with the clearest signal. The selected RDS stations are sorted alphabetically by their Program Service name, then assigned two-character codes. For more details on RDS, see page 58.

After scanning, the display shows the total number of the stored FM RDS stations, and then the station stored in A1 is received.

The following settings will be stored along with the station
ANT (A or B), ANT ATT, IF Band and FM MODE



(continued)

If you perform the scanning again
Some of the preset stations may be replaced with new ones depending on the reception quality.

To cancel the scanning
Perform one of the following procedures.
- Press RETURN. The scanning stops and the display returns to the "Auto-betical" menu.
  If you press RETURN again, the display shows the currently received frequency.
- Press ENTER. The scanning stops and the display shows the currently received frequency.

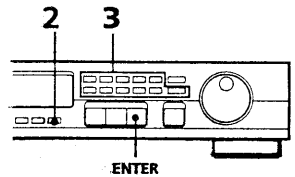
To tune in stored stations
See page 48.

To erase stored stations one by one
1 Press MENU.
2 Rotate the TUNING/SELECT knob until "Clear" appears and then press ENTER.
3 Rotate the TUNING/SELECT knob until the preset station to be erased appears and then press ENTER.
  The frequency stored in the specified code is erased and the digit of the preset code disappears.
4 Repeat steps 1 through 3 for other stored stations to be erased.

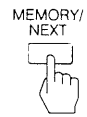
To erase all stored stations at a time
1 Turn off the power.
2 Hold down 5 and MENU, and press POWER to turn on the power again.

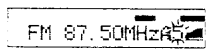
Notes
- If you move to another area, do this procedure again to store the stations for the new broadcast area.
- If you move the antenna after storing stations using "Auto-betical", the stored settings will no longer be valid. If this happens, store the stations again.

Preset Tuning

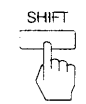


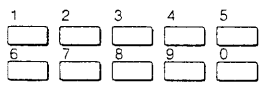
2

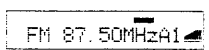




3







Storing Stations Manually

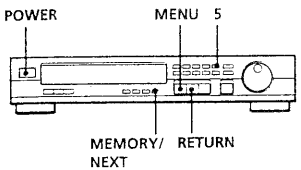
This procedure shows you how to select and store FM and MW/LW stations one by one. This procedure is useful if you want to select just which stations to store, and for storing FM stations or FM RDS stations with a very weak signal that may not be stored using "Auto-betical select". If you want to automatically store FM and/or FM RDS station in your broadcast area, do one of the procedures described on pages 36 or 40, depending on which tuner you have.

1 Tune in the desired station.
For details on tuning in stations, see pages 24-28 and 48.

2 Press MEMORY/NEXT.
"MEMORY" appears to show that the tuner is ready to store a station.
If the stations is tuned in with the automatic tuning, manual tuning or direct tuning: The lowest vacant code appears. If you want to store the station in that preset code, press ENTER. If you want to specify the other preset code, go to step 3.
If the station is tuned in with the preset tuning: The preset code of that station blinks. If you want to store the station in the same preset code, press ENTER. If you want to specify the other code, go to step 3.

3 Enter the two-character code under which you want the station stored.
Press SHIFT to select A, B, or C
The letter you choose appears on the display. Each time you press SHIFT, the letter changes. Then, press a preset button 0-9. The tuner stores the station under the two-character code.

4 Perform steps 1 through 3 for other stations.



(continued)

If you make a mistake during entry
Perform steps 2 and 3 again.

To cancel the storing while the MEMORY indicator is lit
- Press RETURN or
- Press MEMORY/NEXT.

The following settings will be stored along with the station
ANT (A or B), ANT ATT, IF Band and FM MODE

If you store a new station in the same code
The previously stored station is erased. Each code can hold only one station.

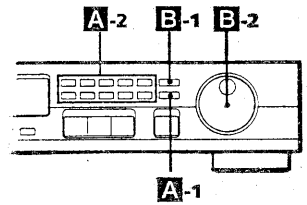
To tune in stored stations
See page 48.

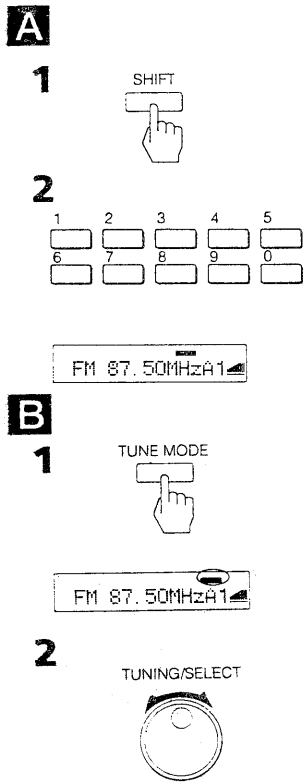
To erase stored stations one by one
1 Press MENU.
2 Rotate the TUNING/SELECT knob until "Clear" appears and then press ENTER.
3 Rotate the TUNING/SELECT knob until the preset station to be erased appears and then press ENTER.
The frequency stored in the specified code is erased and the digit of the preset code disappears.
4 Repeat steps 1 through 3 for other stored stations to be erased.

To erase all stored stations at a time
1 Turn off the power.
2 Hold down 5 and MENU, and press POWER to turn on the power again.

Notes
- If you move to another area, do this procedure again to store the stations for the new broadcast area.
- The stations remain stored in memory for up to one month after turning the power off.

Preset Tuning





Tuning in Stored Stations A

Enter the two-character code of the station you want to listen to.

1 First, press SHIFT to select A, B, or C.

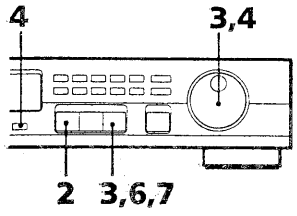
2 Press a preset button 0-9.
The tuner automatically tunes in the station stored under that two-character code.

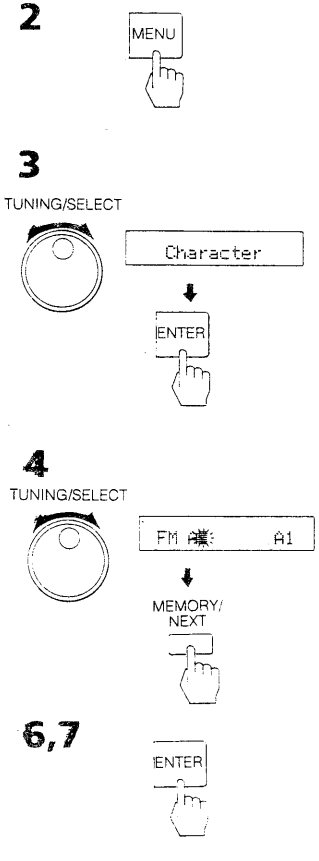
Scanning Manually for Stations B

You can scan only the preset stations without specifying preset codes.

1 Press TUNE MODE repeatedly until the PRESET indicator appears.

2 Rotate the TUNING/SELECT knob until the desired code appears.
- To scan to a higher code, turn the knob clockwise.
- To scan to a lower code, turn the knob counterclockwise.





Assigning Names to Stored Stations

This procedure shows you how to assign a name of up to 5 characters for each stored station except the FM RDS stations. When you tune in a stored station by using the procedure on page 48, the name appears on the display instead of the frequency.

1 Tune in a preset station except the FM RDS stations.
See page 48.

2 Press MENU.

3 Rotate the TUNING/SELECT knob until "Character" appears and then press ENTER.

4 Rotate the TUNING/SELECT knob until the desired character appears and then press MEMORY/NEXT.
The first character stops blinking and the cursor of the second position blinks.

The list of characters you can choose from is shown on the next page.
To search forward through the list, turn the knob clockwise. To search backward through the list, turn the knob counterclockwise.

5 Repeat step 4 until you obtain the desired name.

6 Press ENTER.
The name you created is set and the preset code in which the name will be stored blinks.

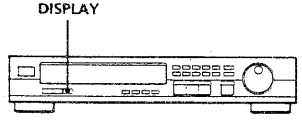
7 Press ENTER again.

a)

(space), A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, [, \,], ^, _, ll, a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, {, |, }, ¯, á, à, é, è, í, ì, ó, ò, ú, ù, Ñ,Ç, Ş, β, ¡, Ll, â, ä, ê, ë, î, ï, ô, ö, û, ü, ñ,ç, ş, ğ, ı, Ä, ª, α, Ö, Å, Ğ, ė, ñ, Æ, π, Œ, £, $, ←, ↑, →, ↓, º, Ø, ã, å, ±, ĺ, ń, æ, µ, ¿, ÷, œ, ø, Ω, Σ, §, !, ", #, ¤, %, &, ', (,),*, +, ,, −, ., /, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, :, ;, <, =, >, ?, @

spacja
пробел

A



(continued)

To modify a name
Even after pressing the ENTER button, you can change the character. In step 4 or 5, press the MEMORY/NEXT button so that the character to be changed blinks and then perform steps 4 through 7.

To store the station after assigning the name
In step 1 above, even if you tuned in a station other than a preset station, you can store it with the assigned name.
After pressing ENTER in step 6, press the two-character code within 8 seconds and then press ENTER.

a) Character List

Displaying the Name A

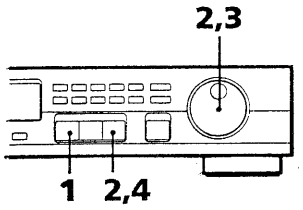
You can assign names to stored stations by doing the procedure on page 50. To display the name of a stored station, press DISPLAY. Each time you press DISPLAY, the display alternates between the station frequency, name, and digital signal meter.

Station name
↓
Frequency
↓
Digital signal meter*

* For FM, the digital signal meter displays the strength of the received signal.
For best reception, adjust the direction of the antenna until the digital signal meter indicates the signal at its peak strength.
When you tune in an AM station, the digital signal meter shows "– – dB" and it does not function.

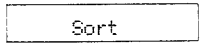
Notes on the DISPLAY button of the

When receiving an RDS station, see page 64 for use of the DISPLAY button.

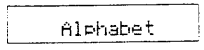


1

2 TUNING/SELECT



3 TUNING/SELECT



4

Preset Tuning

Sorting the Preset Stations

To easily search for a desired preset station, this unit has a preset station sorting function. You can sort the preset stations in alphabetical order ("Alphabet"), in order of signal strength ("Strength"), or according to the reception band ("Band"). In addition, you can sort the preset RDS stations in order of country code ("Country")

1 Press MENU.

2 Rotate the TUNING/SELECT knob until "Sort" appears and then press ENTER.
"Select" appears.

3 Rotate the TUNING/SELECT knob until the desired way of sorting appears.
By rotating the knob, the display changes in the following order:

"Alphabet"
↕
"Strength"
↕
"Country"
↕
"Band"

4 Press ENTER.
The unit sorts the preset stations in the order you selected and then receives the preset station stored in A1.

Preset Tuning

(continued)

How the unit arranges the preset stations

"Alphabet":
The unit arranges the preset stations that have station names in alphabetical order. Station names that have a space as the first character are selected first, followed by names starting with an alphabetic character, symbol or numerical digit, in that order.
Preset stations that have no station names are arranged by frequency, from low to high.

"Strength":
The unit sorts FM preset stations in order of signal strength, starting with stations that have names, followed by stations that have no names.
The rest of the stations are arranged by frequency, from low to high.

"Country":
The unit arranges FM RDS stations that have a PI code (see page 62) in order of country code (1 - 9 and A - F). (Stations that have the same country code are arranged in alphabetical order.)
The rest of the stations are arranged by frequency, from low to high.

Note
Since some countries have the same country code (or a certain country has two country codes), stations in different countries may be arranged together.

"Band":
The unit sorts FM RDS stations that have names in alphabetical order, followed by FM RDS stations that have no names. After that, the unit arranges regular FM stations from low to high frequencies, and then arranges the remaining stations in the same manner.

SECTION 2
TEST MODE

NOTE : The preset data will be erased when this test mode is used. Therefore, take down the data before setting this mode and preset the data again after completing operations in this mode.

1. Display Tube Key Check Mode

1-1. Display Tube Check

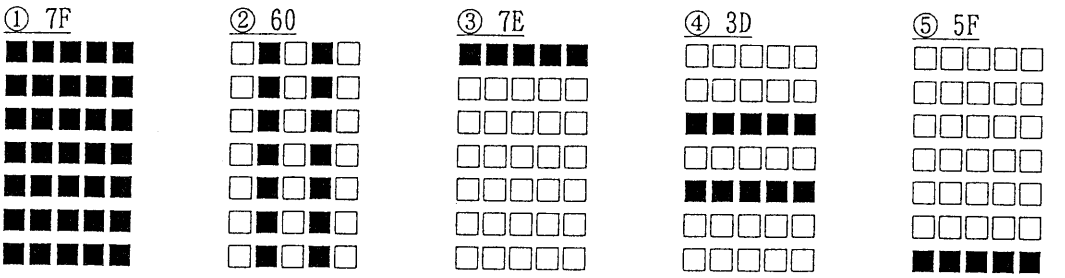
1-1-1. Turn OFF the power.

1-1-2. While pressing [1] and [MENU] together, turn ON [POWER].

1-1-3. While continuously pressing [1] and [MENU] together, check the following.

Microcomputer version indication (1 sec)→ All light up "7F" → Dot erea only "60" → Dot erea only "7E" ↓ Dot erea only "3D" ← Dot erea only "5F"

Indication test pattern



* The indication test patterns from ② to ⑤ are indicated on only even grids.

The display changes every 500 msec.

1-2. Setting the KEY CHECK MODE

1-2-1. Release [1] and [MENU]. The KEY CHECK mode will be set.

1-2-2. All key numbers will be displayed.
Key Number : 23

1-2-3. Each time the key is pressed, the key number will be counted down.
Each key will be counted only once, at the first time.

1-2-4. When all keys have been pressed, the process will end and the factory preset will be entered.

2. Entering the Factory Preset

To skip "1. Display Tube Key Check Mode", and factory preset:

(1) Turn OFF the power.
(2) While pressing [3] and [MENU] together, turn ON [POWER].

3. Circuit Check Mode

Set to the reception frequency that the circuit can STEREO RDS stations. (Set the input level to above 70 dB.)

(1) Turn OFF the power.
(2) While pressing [4] and [MENU] together, turn ON [POWER].

• The items in the following table will be checked automatically in order every 2 seconds.

Display	Items	DISPLAY		NG
		FM RDS	AM (MW, LW)	
Tuned	AST signal =LOW	OK or NG		IC251 NG, RV251 adjustments
IF Fra	IF COUNT OK	OK or NG	OK or NG	IC501 NG, T252 adjustments
Sig Level	SI LEVEL≧70dB	OK or NG	OK or NG	IC221 NG, RV221 adjustments
Stereo	ST signal=LOW	OK or NG		IC301 NG
RDS Signal	RDS DATA OK	OK or NG		IC801 NG

4. Forced RESET

Clears all the RAMs and sets the initial state
(1) Turn OFF the power.
(2) While pressing [5] and [MENU] together, turn ON [POWER].
(3) To return to the preset state, perform the display tube key check mode again.

SECTION 3
ELECTRICAL ADJUSTMENTS

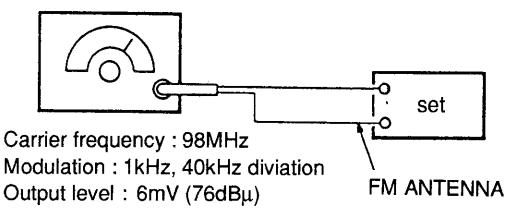
Precautions in Repairing

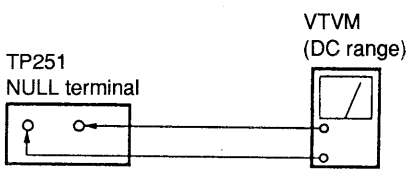
If the front end unit fails, it is difficult to repair the inner circuits, so replace the entire front end unit.

FM SECTION

FM Discriminator ADJUSTMENT (NULL Adjustment)

Setting :
BAND : FM



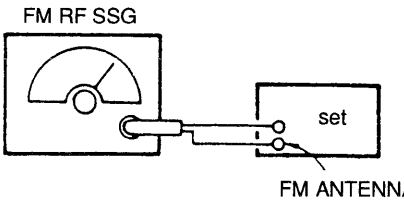


Procedure :
1. Tune the set to 98 MHz.
2. Adjust T252 for 0Vdc reading on the VOM.

Note : FM Tuning Level adjustment should be made after FM discriminator alignment.

Stereo Operation Adjustment

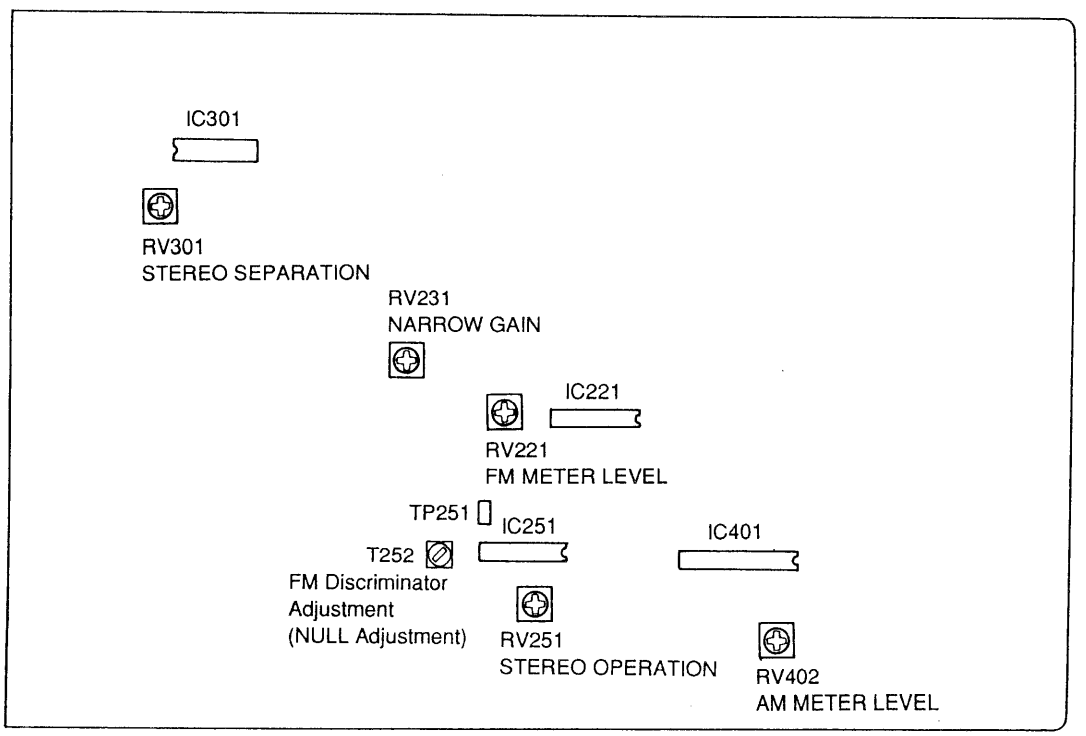
Setting :
BAND : FM



Carrier frequency : 98 MHz
Modulation : 1kHz, 40kHz diviation
Output level : 32μV (30 dB)

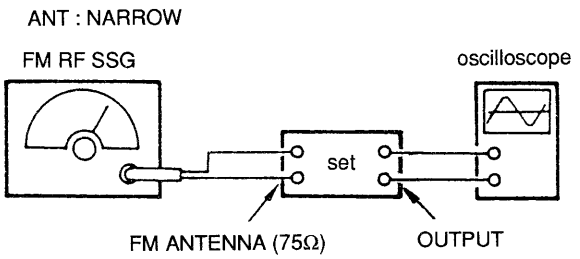
Procedure :
1. Tune the set to 98 MHz.
2. Adjust RV251 so that the STEREO indicator goes on.

Adjustment Location :



Narrow Gain Adjustment

Setting :
BAND : FM

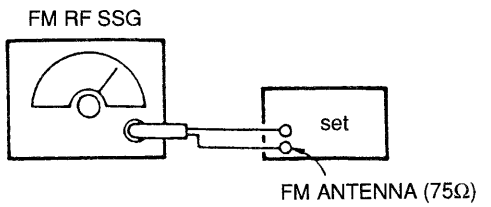


Carrier frequency : 98 MHz
Modulation : 1kHz, 40kHz diviation
Output level : 32μV (30 dB)

Procedure :
1. Tune the set to 98 MHz.
2. Adjust RV231 at the position where the waveform suddenly appears on the oscilloscope (Narrow Gain adj.)

FM Meter Level Adjustment

Setting :
BAND : FM

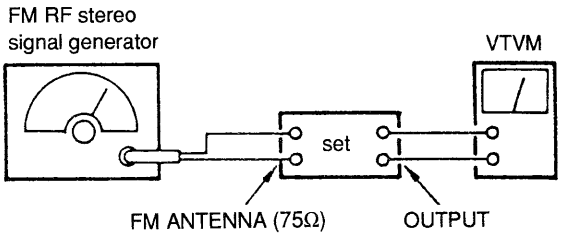


Carrier frequency : 98 MHz
Modulation : 1kHz, 40kHz diviation
Output level : 3mV (70 dBμ)

Procedure :
1. Tune the set to 98 MHz.
2. Adjust RV221 so that 1 to 10 indication bars light up on the signal meter.

Stereo Separation Adjustment

Setting :
BAND : FM



Carrier frequency : 98 MHz
Modulation : 1kHz, 40kHz diviation
Output level : 6mV (76 dBμ)

Procedure :

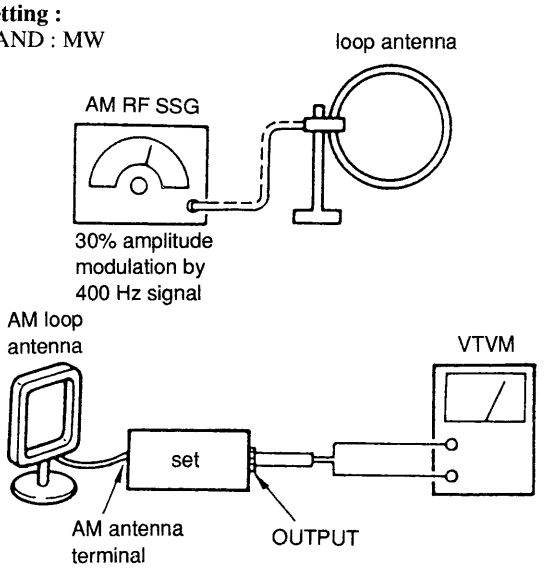
FM stereo Signal generator Output channel	VTVM connection	VTVM reading (dB)
L-CH	L-CH	Ⓐ
R-CH	L-CH	Ⓑ Adjust RV301 for minimum reading.
R-CH	R-CH	Ⓒ
L-CH	R-CH	Ⓓ Adjust RV301 for minimum reading.

L-CH Stereo separation : Ⓐ—Ⓑ
R-CH Stereo separation : Ⓒ—Ⓓ

The separations of both channels should be equal.

AM SECTION

Setting :
BAND : MW

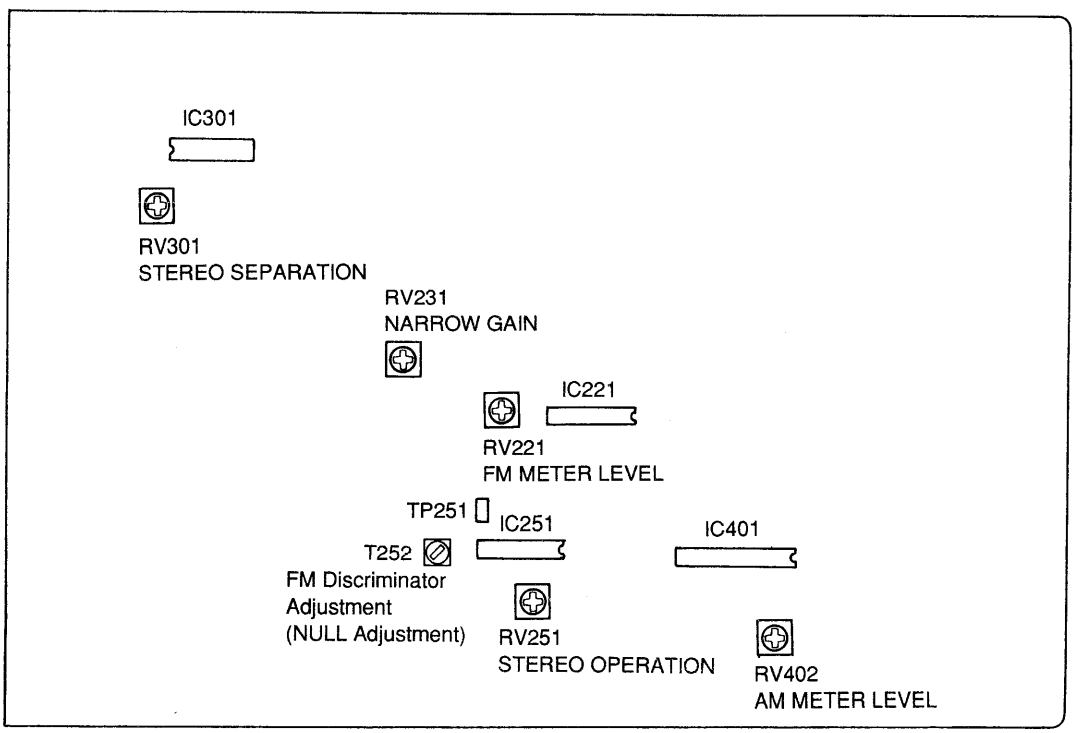


AM Meter Level Adjustment

Setting :
Carrier frequency : 216kHz
Modulation : 400Hz, 30% modulation

Procedure :
1. Set AM RF signal generator so that the AM antenna input level becomes 74dBμ/m (5mV/m).
2. Adjust RV402 so that 1 to 10 indication bars light up on the signal meter.

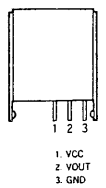
Adjustment Location :



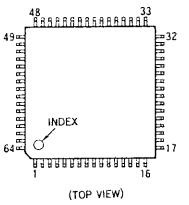
SECTION 4
DIAGRAMS

4-1. SEMICONDUCTOR LEAD LAYOUTS

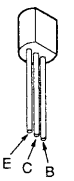
GP1U57XB



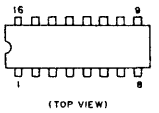
LC75711E
µPD78014GC-591-AB8



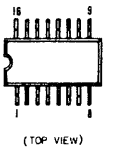
2SC3112-B



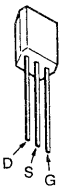
LA1235



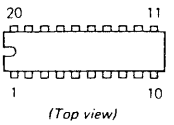
SAA6579T



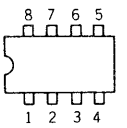
2SK161-YGR



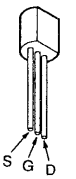
LA1245



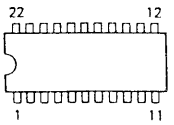
µPC4558C



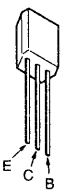
2SK246-GR3



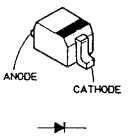
LA3401



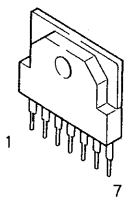
DTA144ES
DTC114TS
DTC144ES
2SC2669OY-TPE4



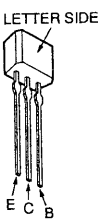
DTZ6.8C
DTZ27B
1SS355



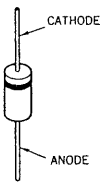
LA5667



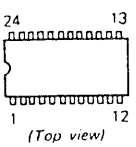
2SA1175-HFE
2SC2785-HFE
2SC3623A-LK



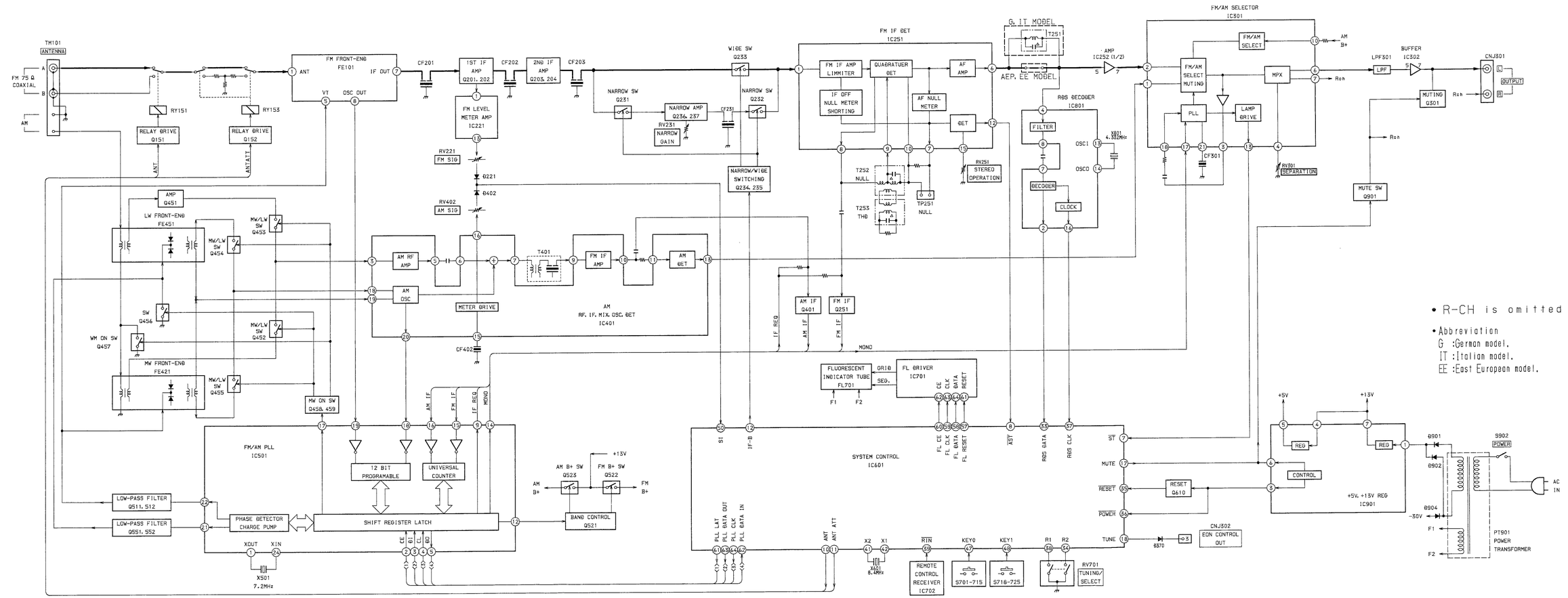
10E2



LC7218-ST



4-2. BLOCK DIAGRAM



09

4-3. PRINTED WIRING BOARDS — TUNER SECTION —

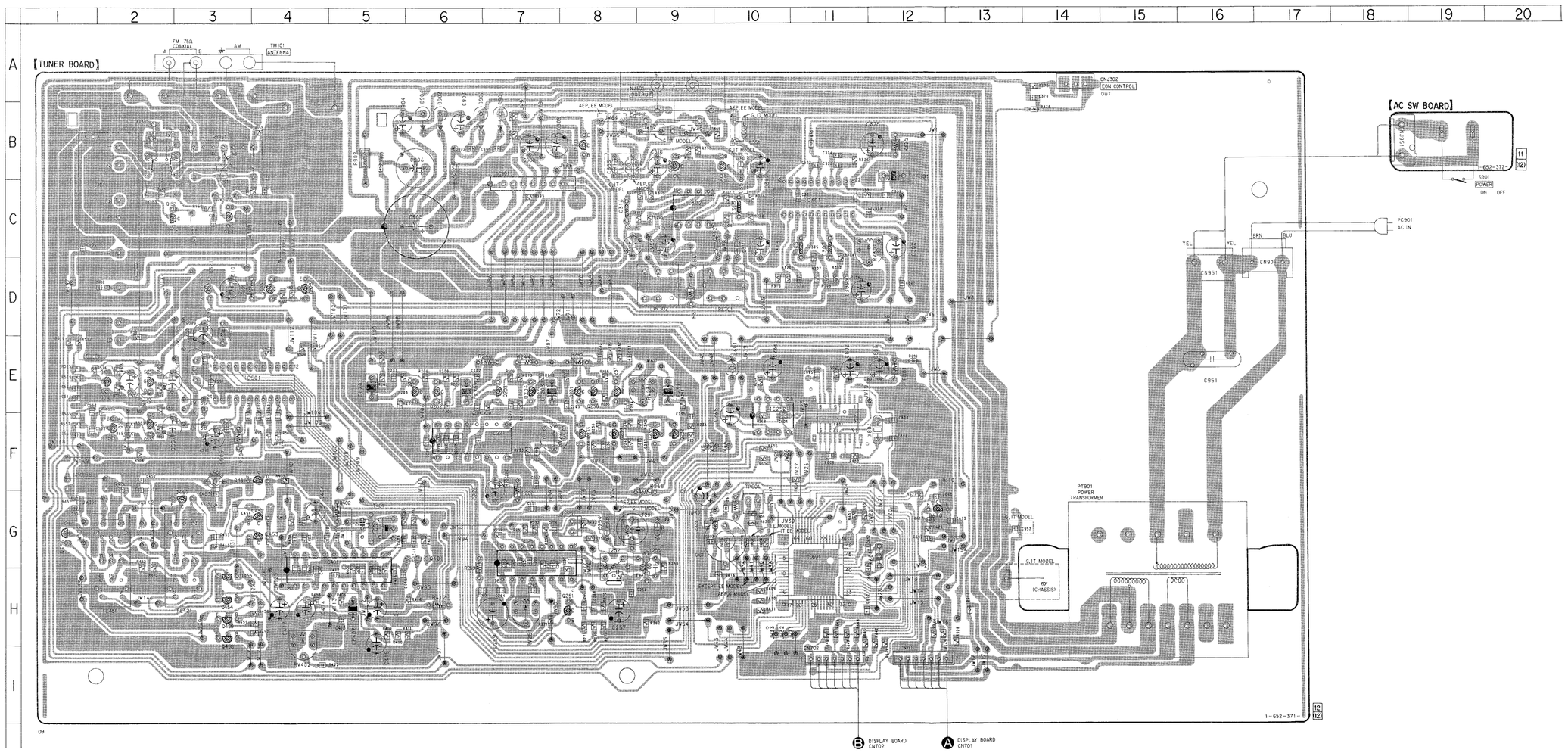
• See page 14 for Semiconductor Lead Layouts.

Note:

- ○—— : parts extracted from the component side.
- ▒▒▒ : Pattern from the side which enable seeing.
- Abbreviation
  - G : German model.
  - IT : Italian model.
  - EE : East European model.

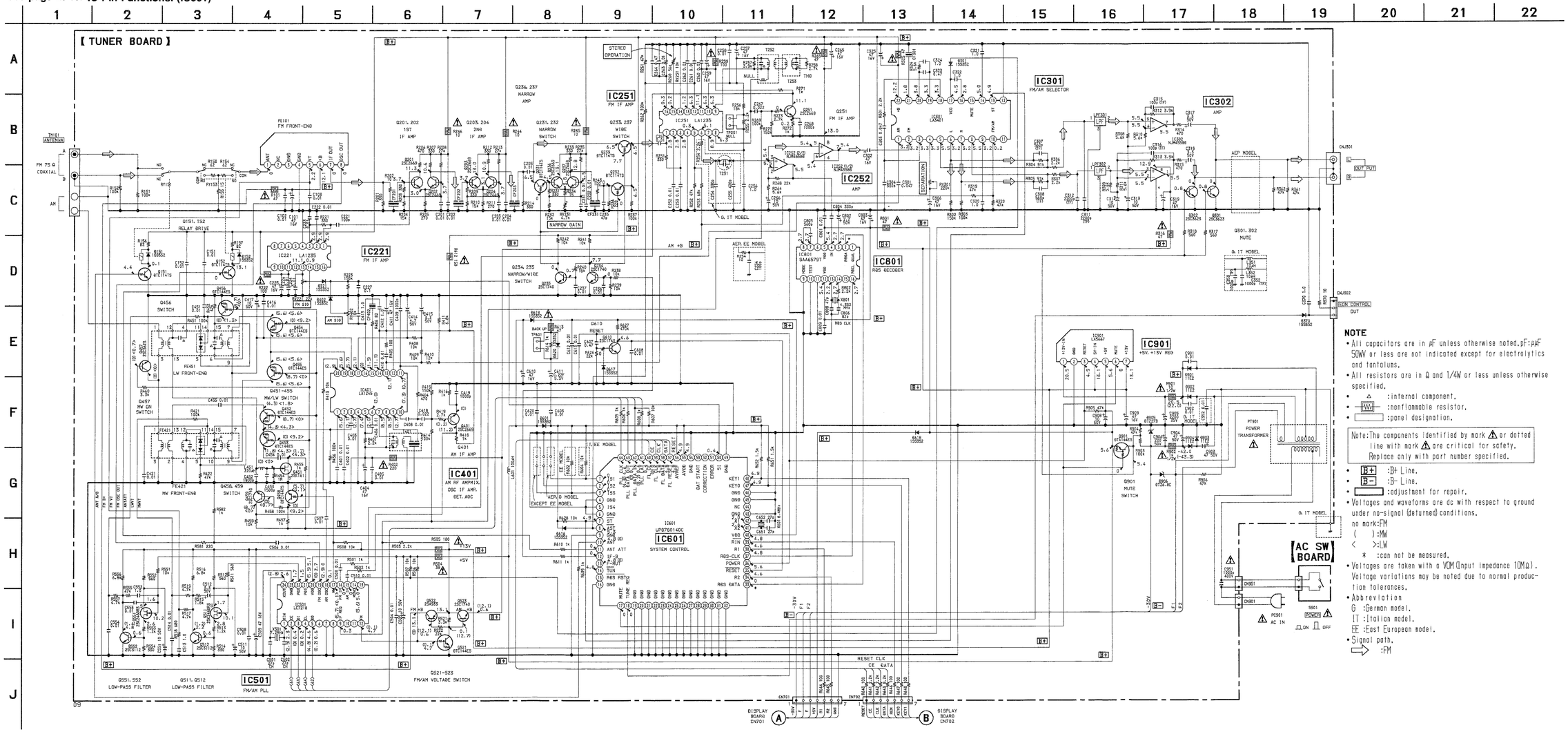
• **Semiconductor Location**

Ref. No.	Location	Ref. No.	Location
D151	B-3	Q202	E-6
D152	C-2	Q203	E-7
D221	F-7	Q204	E-7
D301	B-11	Q231	E-8
D370	B-14	Q232	F-9
D402	I-4	Q233	F-8
D601	G-9	Q234	F-8
D616	H-10	Q235	F-9
D617	G-12	Q236	E-8
D618	E-12	Q237	E-8
D619	G-10	Q251	H-8
D620	G-10	Q301	B-10
D901	A-7	Q302	B-9
D902	A-6	Q401	G-6
D903	A-6	Q451	F-3
D904	A-6	Q452	G-4
D905	B-5	Q453	G-4
D906	H-13	Q454	H-3
		Q455	H-3
IC221	F-7	Q456	G-1
IC251	G-7	Q457	G-3
IC252	E-10	Q458	H-3
IC301	C-11	Q459	H-3
IC302	C-9	Q511	E-2
IC401	G-4	Q512	E-2
IC501	E-3	Q521	D-3
IC601	G-11	Q522	D-4
IC801	F-11	Q523	D-4
IC901	B-7	Q551	F-2
		Q552	F-2
Q151	C-3	Q610	G-12
Q152	C-2	Q901	B-8
Q201	E-6		



4-4. SCHEMATIC DIAGRAM — TUNER SECTION —

- See page 27 for IC Block Diagrams.
- See page 29 for IC Pin Functions. (IC601)



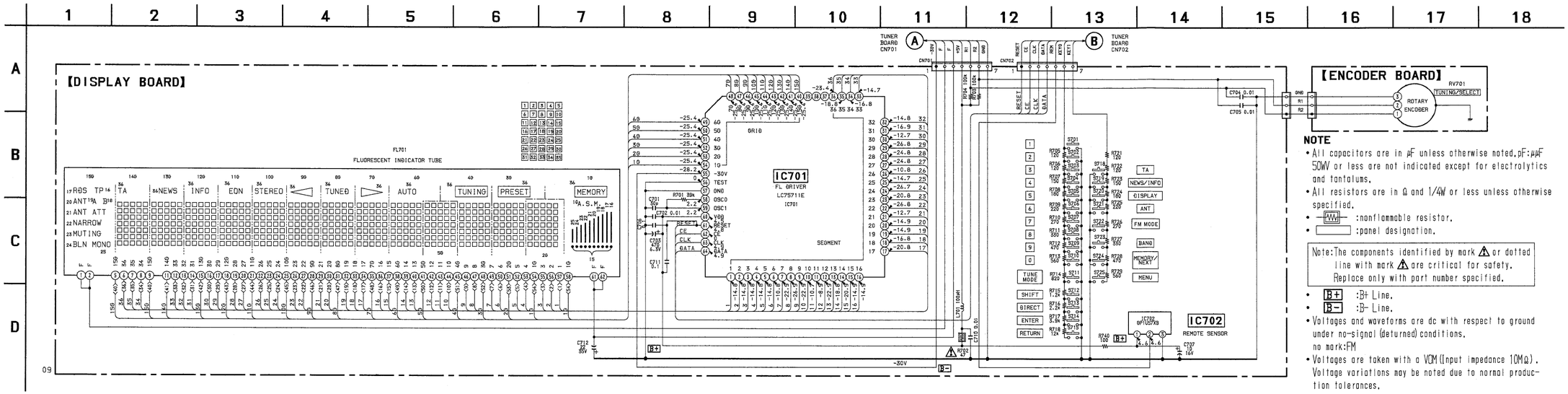
NOTE

- All capacitors are in μF unless otherwise noted. pF: μμF
  50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- △ : internal component.
- : nonflammable resistor.
- : panel designation.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

- B+ : B+ Line.
- B- : B- Line.
- : adjustment for repair.
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
  no mark: FM
  ( ): MW
  < >: LW
  * : can not be measured.
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Abbreviation
  G : German model.
  IT : Italian model.
  EE : East European model.
- Signal path.
  ⇨ : FM

4-5. SCHEMATIC DIAGRAM — DISPLAY SECTION —



NOTE

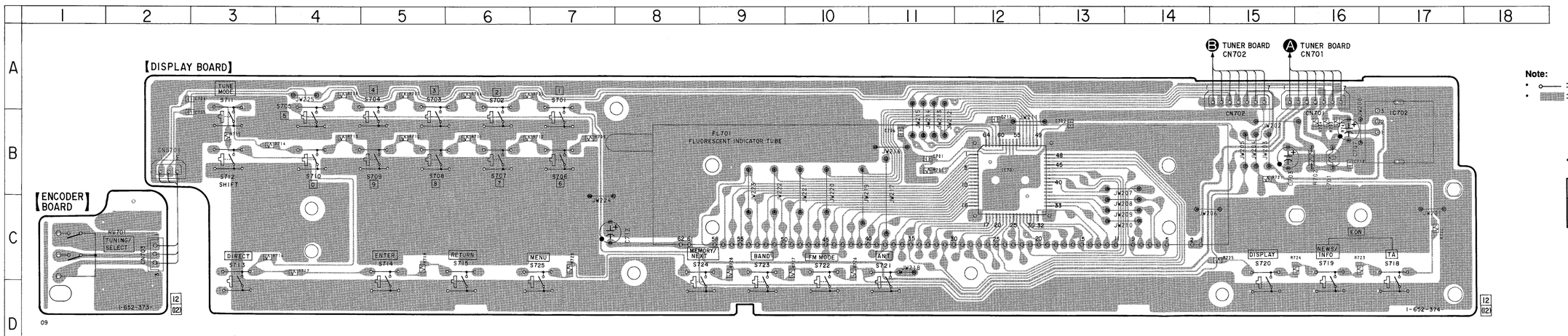
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- : nonflammable resistor.
- : panel designation.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

- B+ : B+ Line.
- B- : B- Line.
- Voltages and waveforms are dc with respect to ground under no-signal (deturned) conditions. no mark: FM
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.

4-6. PRINTED WIRING BOARDS — DISPLAY SECTION —

• See page 14 for Semiconductor Lead Layouts.



Note:

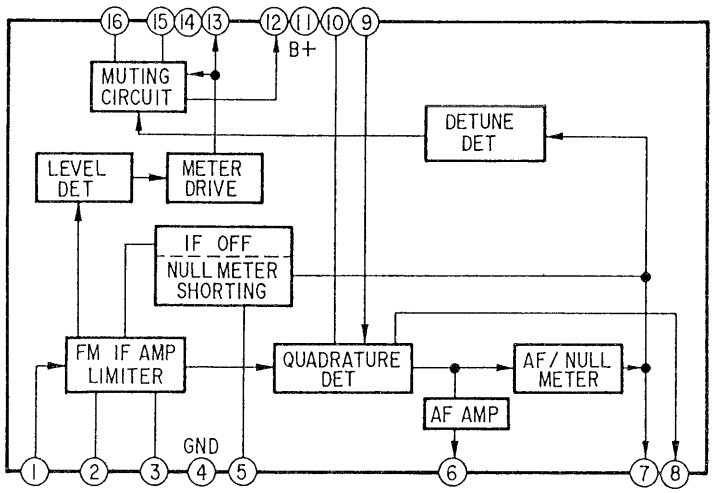
- : parts extracted from the component side.
- : Pattern from the side which enable seeing.

- **Semiconductor Location**

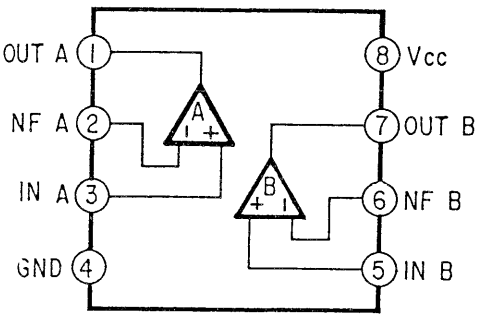
Ref. No.	Location
IC701	B-12
IC702	B-17

4-7. IC BLOCK DIAGRAMS

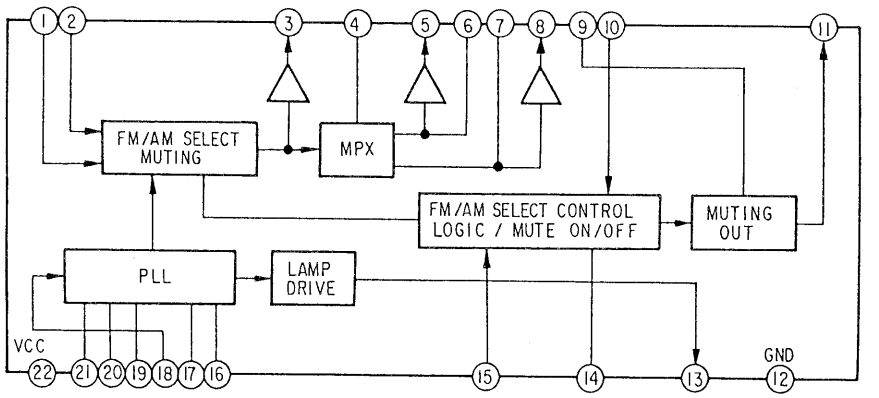
IC221, 251 LA1235



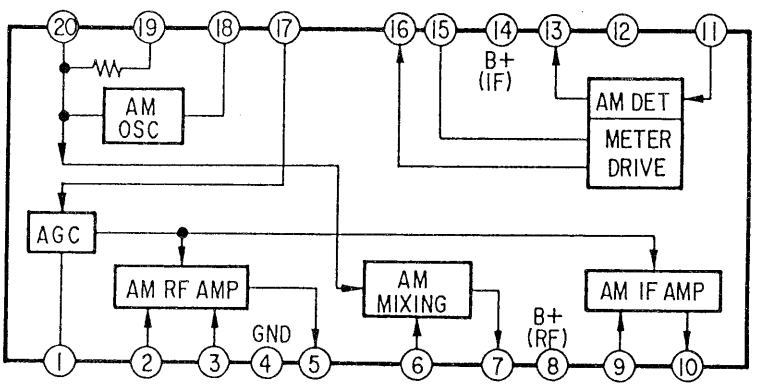
IC252, 302 NJM4558D



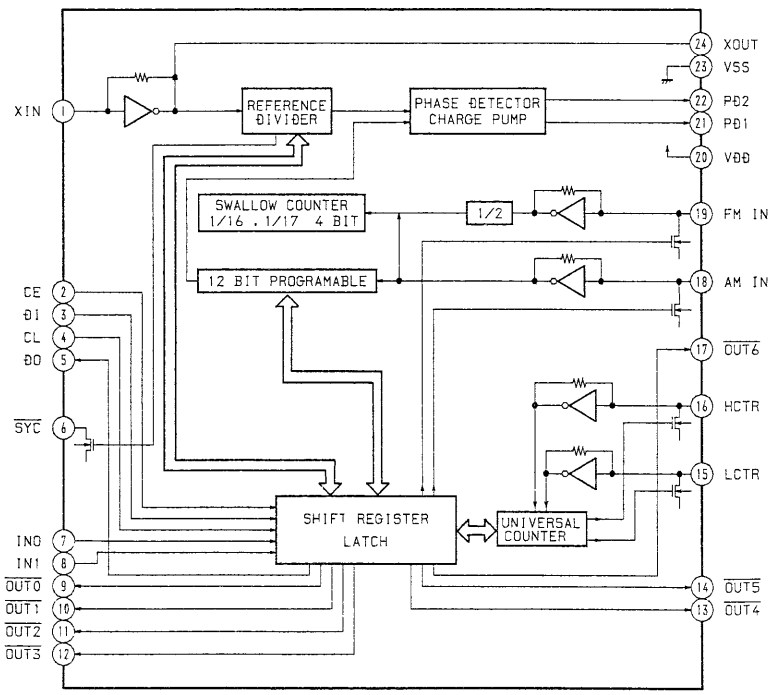
IC301 LA3401



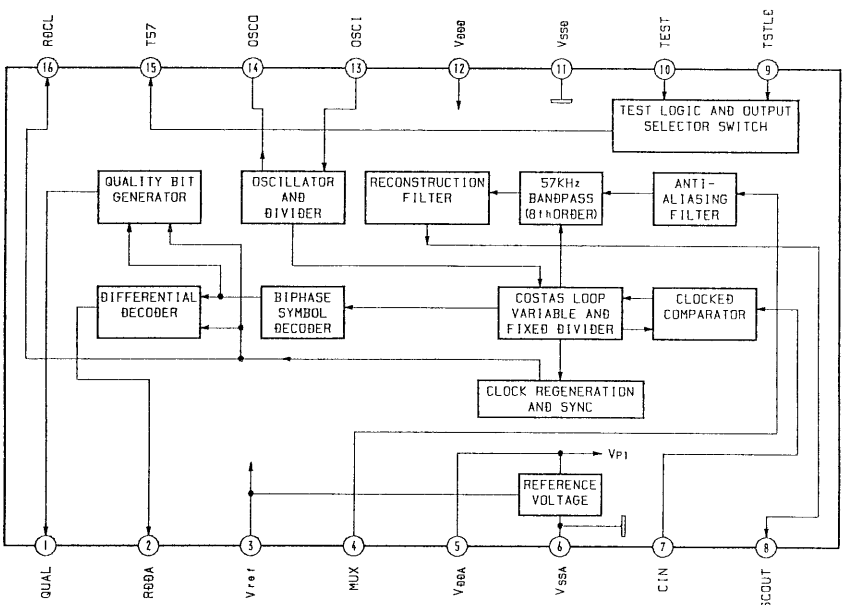
IC401 LA1245



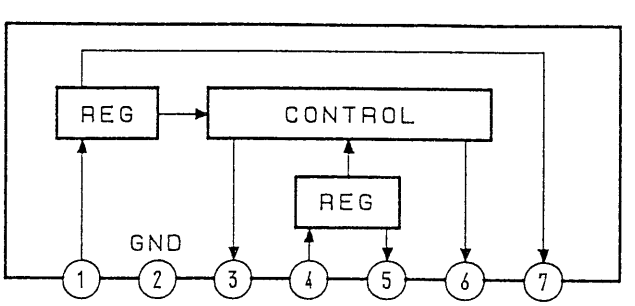
IC501 LC7218



IC801 SAA6579T



IC901 LA5667



4-8. IC PIN FUNCTIONS

- **IC601 System Control IC (μPD78014GC-591-AB8)**

Pin No.	Pin Name	I/O	Function
1	IS1	I	Model detection IS1 IS2 IS3 AEP, German model L L L Italian model H L L East European model H L H
2	IS2	I	
3	IS3	I	
4	GND	–	Not used (GND)
5	IS4	I	ANTENNA SELECT input (GND)
6	GND	–	Not used (GND)
7	$\overline{ST}$	I	STEREO display detection
8	$\overline{AST}$	I	AUTO STOP signal detection
9	VSS	–	System GND
10	ANT	O	ANT A/B switching
11	ANT ATT	O	ANT ATT on/off switching
12	IF-B	O	IF BAND wide/narrow switching
13	F-MUT	O	Not used (open)
14	$\overline{TUN}$	O	Not used (open)
15	$\overline{RDS\ RESET}$	O	Not used (open)
16	GND	–	Not used (GND)
17	$\overline{MUTE}$	O	Muting signal output
18	TUN REQ	O	TUNING REQUEST
19 to 23	GND	–	Not used (GND)
24	VSS	–	System GND
25 to 32	GND	–	Not used (GND)
33	RDS-DATA	I	RDS DATA input
34	R2	I	Rotary encoder phase detection
35	$\overline{RESET}$	I	System reset input
36	$\overline{POWER}$	I	Power supply on/off monitor
37	RDS-CLK	I	Not used (open)
38	R1	I	Rotary encoder number of rotations detection
39	$\overline{RIN}$	I	Remote controller input
40	VDD	–	Power supply (+5V)
41	X2	–	Oscillation signal output (8.38 MHz)
42	X1	–	Oscillation signal input (8.38 MHz)
43	GND	–	Not used (GND)
44	NC	–	Not used (open)
45, 46	GND	–	Not used (GND)
47	KEY0	I	Key input
48	KEY1	I	Key input
49	GND	–	Not used (GND)
50	SI	I	Signal input

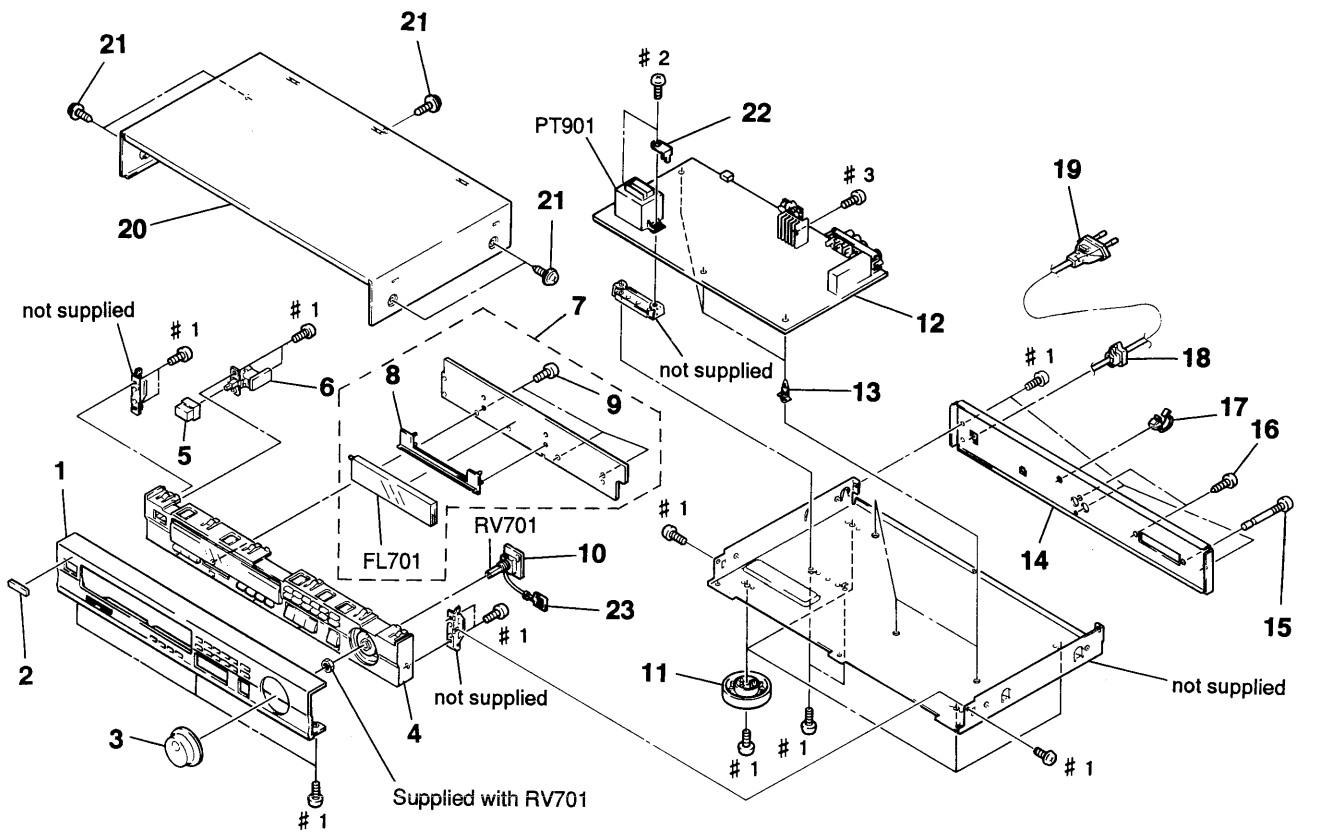
Pin No.	Pin Name	I/O	Function
51	ERROR	–	Not used (open)
52	CORRECTION	–	Not used (open)
53	DAT START	–	Not used (open)
54	GND	–	Not used (GND)
55	AVDD	–	Analog power supply of the A/D converter (+5V)
56	AVREF	I	Reference voltage of the A/D converter (+5V)
57	$\overline{\text{FL RESET}}$	O	Reset for LC75711E
58	FL DATA	O	Display data for LC75711E
59	FL CLK	O	CLock for LC75711E
60	FL CE	O	Latch for LC75711E
61	PLL LAT	O	Latch for LC7218
62	PLL DATA IN	I	DATA from LC7218
63	PLL DATA OUT	O	DATA for LC7218
64	PLL CLK	O	Clock for LC7218

SECTION 5
EXPLODED VIEW

NOTE:

- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Color Indication of Appearance Parts Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ ↑
  Parts color Cabinet's color
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.
- Abbreviation
  G : German model
  IT : Italian model
  EE : East European model

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.



Ref. No.	Part No.	Description	Remark
1	4-957-873-31	PANEL, FRONT	
2	4-942-568-01	EMBLEM (NO. 5), SONY	
3	4-965-471-01	KNOB (DIA. 48)	
4	X-4944-761-1	BASE ASSY, PANEL	
5	4-917-460-01	KNOB, POWER	
* 6	1-652-372-11	AC SW BOARD	
* 7	A-4371-010-A	DISPLAY BOARD, COMPLETE	
* 8	4-945-292-01	HOLDER, INDICATION TUBE	
9	4-951-620-01	SCREW (2.6X8), +BVTP	
* 10	1-652-373-11	ENCODER BOARD	
11	4-956-885-11	FOOT (F58175S2W)	
* 12	A-4371-013-A	TUNER BOARD, COMPLETE (AEP)	
* 12	A-4371-014-A	TUNER BOARD, COMPLETE (IT)	
* 12	A-4371-015-A	TUNER BOARD, COMPLETE (G)	
* 12	A-4371-016-A	TUNER BOARD, COMPLETE (EE)	

Ref. No.	Part No.	Description	Remark
* 13	3-346-265-31	HOLDER, PC BOARD	
* 14	4-965-470-61	PANEL, BACK (IT, EE)	
* 14	4-965-470-71	PANEL, BACK (AEP)	
* 14	4-965-470-81	PANEL, BACK (G)	
15	3-704-242-01	SCREW, TERMINAL, + BVTP CLAW	
16	3-704-515-11	SCREW (BV/RING)	
* 17	4-949-235-01	HOOK	
18	3-703-244-00	BUSHING, CORD	
⚠19	1-575-651-21	CORD, POWER	
20	4-923-457-01	CASE	
21	3-704-366-01	SCREW (CASE) (M3X8)	
22	4-957-933-01	PLATE, GROUND (G, IT)	
23	1-690-880-11	LEAD (WITH CONNECTOR)	
FL701	1-517-177-21	INDICATOR TUBE, FLUORESCENT	
⚠PT901	1-423-525-11	TRANSFORMER, POWER	

AC SW **DISPLAY**

SECTION 6
ELECTRICAL PARTS LIST

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Color Indication of Appearance Parts Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ ↑
  Parts color Cabinet's color
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.

- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- SEMICONDUCTORS
  In each case, u: μ , for example:
  uA...: μA..., uPA...: μPA..., uPB...: μPB..., uPC...: μPC..., uPD...: μPD...
- CAPACITORS
  uF : μF
- COILS
  uH : μH
- Abbreviation
  G : German model
  IT : Italian model
  EE : East European model

Ref. No.	Part No.	Description			Remark
*	1-652-372-11	AC SW BOARD			
		**********			
		< SWITCH >			
⚠S901	1-572-267-51	SWITCH, PUSH (AC POWER) (1 KEY) (POWER)			
**********					
*	A-4371-010-A	DISPLAY BOARD, COMPLETE			
		**********			
*	4-945-292-01	HOLDER, INDICATION TUBE			
		< CAPACITOR >			
C701	1-163-104-00	CERAMIC CHIP	30PF	5%	50V
C702	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C703	1-128-183-11	ELECT	470uF	20%	6.3V
C704	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C705	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C706	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C707	1-126-157-11	ELECT	10uF	20%	16V
C710	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C711	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C712	1-124-916-11	ELECT	22MF	20%	63V
		< FLUORESCENT INDICATOR >			
FL701	1-517-177-21	INDICATOR TUBE, FLUORESCENT			
		< IC >			
IC701	8-759-823-57	IC LC75711E			
IC702	8-749-923-43	IC GP1U57XB			
		< COIL >			
L701	1-410-977-11	INDUCTOR	100uH		
		< RESISTOR >			
R701	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
⚠R702	1-249-401-11	CARBON	47	5%	1/4W F
R703	1-216-097-00	METAL CHIP	100K	5%	1/10W
R704	1-216-097-00	METAL CHIP	100K	5%	1/10W
R705	1-216-027-00	METAL CHIP	120	5%	1/10W
R706	1-216-027-00	METAL CHIP	120	5%	1/10W
R707	1-216-029-00	METAL CHIP	150	5%	1/10W
R708	1-216-031-00	METAL CHIP	180	5%	1/10W
R709	1-216-033-00	METAL CHIP	220	5%	1/10W
R710	1-216-035-00	METAL CHIP	270	5%	1/10W
R711	1-216-037-00	METAL CHIP	330	5%	1/10W
R712	1-216-041-00	METAL CHIP	470	5%	1/10W
R713	1-216-043-00	METAL CHIP	560	5%	1/10W
R714	1-216-047-00	METAL CHIP	820	5%	1/10W
R715	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R716	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R717	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R718	1-216-075-00	METAL CHIP	12K	5%	1/10W
R721	1-216-027-00	METAL CHIP	120	5%	1/10W
R722	1-216-027-00	METAL CHIP	120	5%	1/10W
R723	1-216-029-00	METAL CHIP	150	5%	1/10W
R724	1-216-031-00	METAL CHIP	180	5%	1/10W
R725	1-216-033-00	METAL CHIP	220	5%	1/10W
R726	1-216-035-00	METAL CHIP	270	5%	1/10W
R727	1-216-037-00	METAL CHIP	330	5%	1/10W
R728	1-216-041-00	METAL CHIP	470	5%	1/10W
R729	1-216-043-00	METAL CHIP	560	5%	1/10W
R740	1-216-025-00	METAL CHIP	100	5%	1/10W
		< SWITCH >			
S701	1-554-303-21	SWITCH, TACTILE (1)			
S702	1-554-303-21	SWITCH, TACTILE (2)			
S703	1-554-303-21	SWITCH, TACTILE (3)			
S704	1-554-303-21	SWITCH, TACTILE (4)			
S705	1-554-303-21	SWITCH, TACTILE (5)			
S706	1-554-303-21	SWITCH, TACTILE (6)			
S707	1-554-303-21	SWITCH, TACTILE (7)			
S708	1-554-303-21	SWITCH, TACTILE (8)			
S709	1-554-303-21	SWITCH, TACTILE (9)			
S710	1-554-303-21	SWITCH, TACTILE (0)			
S711	1-554-303-21	SWITCH, TACTILE (TUNING/PRESET)			
S712	1-554-303-21	SWITCH, TACTILE (SHIFT)			
S713	1-554-303-21	SWITCH, TACTILE (DIRECT)			
S714	1-554-303-21	SWITCH, TACTILE (ENTER)			
S715	1-554-303-21	SWITCH, TACTILE (RETURN)			
S718	1-554-303-21	SWITCH, TACTILE (TA)			

Ref.No.	Part No.	Description			Remark
S719	1-554-303-21	SWITCH, TACTILE (NEWS/INFO)			
S720	1-554-303-21	SWITCH, TACTILE (DISPLAY)			
S721	1-554-303-21	SWITCH, TACTILE (ANT)			
S722	1-554-303-21	SWITCH, TACTILE (AUTO TUNING/FM MODE)			
S723	1-554-303-21	SWITCH, TACTILE (BAND)			
S724	1-554-303-21	SWITCH, TACTILE (MEMORY/NEXT)			
S725	1-554-303-21	SWITCH, TACTILE (MENU)			
**********					
*	1-652-373-11	ENCODER BOARD			
		**********			
	1-690-880-11	LEAD (WITH CONNECTOR)			
		< VARIABLE RESISTOR >			
RV701	1-467-703-11	ENCODER, ROTARY (TUNING/SELECT)			
**********					
*	A-4371-013-A	TUNER BOARD, COMPLETE (AEP)			
		**********			
*	A-4371-014-A	TUNER BOARD, COMPLETE (IT)			
		**********			
*	A-4371-015-A	TUNER BOARD, COMPLETE (G)			
		**********			
*	A-4371-016-A	TUNER BOARD, COMPLETE (EE)			
		**********			
	4-957-933-01	PLATE, GROUND (G, IT)			
	7-682-548-09	SCREW +B 3X8			
		< CAPACITOR >			
C101	1-124-477-11	ELECT	47uF	20%	25V
C102	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C103	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C151	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C152	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C201	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C202	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C203	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C204	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C205	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C221	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C222	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C223	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C224	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C225	1-124-477-11	ELECT	47uF	20%	25V
C226	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C227	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C231	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C232	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C235	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C236	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C237	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C251	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C252	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C253	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C254	1-110-335-11	MYLAR	100PF	5%	50V (AEP, EE)
C254	1-110-341-11	MYLAR	330PF	5%	50V (G, IT)
C255	1-130-467-00	MYLAR	470PF	5%	50V (G, IT)
C256	1-164-346-11	CERAMIC CHIP	1uF		16V
C257	1-124-477-11	ELECT	47uF	20%	25V
C258	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C259	1-124-477-11	ELECT	47uF	20%	25V
C260	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C261	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C262	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C263	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C264	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C265	1-124-477-11	ELECT	47uF	20%	25V
C266	1-124-907-11	ELECT	10uF	20%	50V
C267	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C268	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V
C301	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C302	1-124-477-11	ELECT	47uF	20%	25V
C303	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C304	1-163-129-00	CERAMIC CHIP	330PF	5%	50V
C306	1-124-477-11	ELECT	47uF	20%	25V
C307	1-130-468-00	MYLAR	560PF	5%	50V
C308	1-130-468-00	MYLAR	560PF	5%	50V
C311	1-130-475-00	MYLAR	0.0022uF	5%	50V
C312	1-130-475-00	MYLAR	0.0022uF	5%	50V
C313	1-124-907-11	ELECT	10uF	20%	50V
C314	1-124-907-11	ELECT	10uF	20%	50V
C315	1-110-335-11	MYLAR	100PF	5%	50V
C316	1-110-335-11	MYLAR	100PF	5%	50V
C317	1-126-962-11	ELECT	3.3uF	20%	50V
C318	1-126-962-11	ELECT	3.3uF	20%	50V
C319	1-124-477-11	ELECT	47uF	20%	25V
C320	1-164-346-11	CERAMIC CHIP	1uF		16V
C321	1-164-346-11	CERAMIC CHIP	1uF		16V
C322	1-164-346-11	CERAMIC CHIP	1uF		16V
C323	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C324	1-164-346-11	CERAMIC CHIP	1uF		16V
C325	1-124-477-11	ELECT	47uF	20%	25V
C352	1-130-471-00	MYLAR	0.001uF	5%	50V (G, IT)
C353	1-130-471-00	MYLAR	0.001uF	5%	50V (G, IT)
C370	1-164-346-11	CERAMIC CHIP	1uF	5%	50V
C401	1-164-232-11	CERAMIC CHIP	0.01uF		50V

TUNER

Ref. No.	Part No.	Description			Remark
C402	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C403	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C404	1-124-477-11	ELECT	47uF	20%	25V
C405	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C406	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C408	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C409	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V
C410	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C411	1-124-477-11	ELECT	47uF	20%	25V
C412	1-164-346-11	CERAMIC CHIP	1uF		16V
C413	1-164-346-11	CERAMIC CHIP	1uF		16V
C414	1-124-927-11	ELECT	4.7uF	20%	100V
C415	1-126-962-11	ELECT	3.3uF	20%	50V
C416	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C417	1-124-907-11	ELECT	10uF	20%	50V
C418	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C419	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V
C421	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C451	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C452	1-164-693-11	CERAMIC CHIP	0.0018uF	5%	50V
C453	1-163-145-00	CERAMIC CHIP	0.0015uF	5%	50V
C454	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C455	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C501	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C502	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C503	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C504	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C505	1-124-907-11	ELECT	10uF	20%	50V
C506	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C507	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C508	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C509	1-124-477-11	ELECT	47uF	20%	25V
C510	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C511	1-124-907-11	ELECT	10uF	20%	50V
C512	1-126-962-11	ELECT	3.3uF	20%	50V
C513	1-164-346-11	CERAMIC CHIP	1uF		16V
C514	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C551	1-124-907-11	ELECT	10uF	20%	50V
C552	1-164-346-11	CERAMIC CHIP	1uF		16V
C553	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C554	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C603	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C607	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C608	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C610	1-124-477-11	ELECT	47MF	20%	25V
C611	1-104-905-11	DOUBLE LAYERS	0.22F		5.5V
C612	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C613	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C620	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C651	1-163-237-11	CERAMIC CHIP	27PF	5%	50V

Ref. No.	Part No.	Description			Remark
C652	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C801	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C802	1-124-925-11	ELECT	2.2uF	20%	100V
C803	1-124-477-11	ELECT	47uF	20%	25V
C804	1-163-129-00	CERAMIC CHIP	330PF	5%	50V
C805	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C806	1-163-249-11	CERAMIC CHIP	82PF	5%	50V
C808	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C809	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C901	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C902	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C903	1-124-910-11	ELECT	47uF	20%	50V
C904	1-124-910-11	ELECT	47uF	20%	50V
C905	1-124-618-11	ELECT	2200uF	20%	35V
C906	1-124-911-11	ELECT	220uF	20%	50V
C908	1-124-907-11	ELECT	10uF	20%	50V
C909	1-124-477-11	ELECT	47uF	20%	25V
⚠C951	1-161-741-00	CERAMIC	0.001uF	10%	400V
C952	1-164-232-11	CERAMIC CHIP	0.01uF	10%	100V(G, IT)

< FILTER >

CF201	1-567-389-11	FILTER, CERAMIC
CF202	1-567-389-11	FILTER, CERAMIC
CF203	1-567-389-11	FILTER, CERAMIC
CF231	1-567-107-71	FILTER, CERAMIC
CF301	1-567-250-11	OSCILLATOR, CERAMIC
CF402	1-527-981-00	FILTER, CERAMIC

< CONNECTOR >

CN901	1-580-230-11	PIN, CONNECTOR (PC BOARD) 3P
CN951	1-564-321-11	PIN, CONNECTOR 2P
CNJ301	1-568-250-11	JACK, PIN 2P (OUTPUT)
CNJ302	1-566-212-11	PIN, CONNECTOR 3P (EON CONTROL)

< DIODE >

D151	8-719-988-62	DIODE	1SS355
D152	8-719-988-62	DIODE	1SS355
D221	8-719-988-62	DIODE	1SS355
D301	8-719-988-62	DIODE	1SS355
D370	8-719-988-62	DIODE	1SS355
D402	8-719-988-62	DIODE	1SS355
D601	8-719-988-62	DIODE	1SS355
D616	8-719-988-62	DIODE	1SS355
D617	8-719-988-62	DIODE	1SS355
D618	8-719-988-62	DIODE	1SS355
D619	8-719-988-62	DIODE	1SS355
D620	8-719-988-62	DIODE	1SS355
D901	8-719-200-02	DIODE	10E2
D902	8-719-200-02	DIODE	10E2
D903	8-719-200-02	DIODE	10E2

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
D904	8-719-200-02	DIODE 10E2	
D905	8-719-977-73	DIODE DTZ27B	
D906	8-719-977-13	DIODE DTZ6.8C	
		< FRONTEND >	
FE101	1-465-396-11	FRONT END (3 GANG) (EE)	
FE101	1-693-212-21	FRONT END (FTZ) (AEP, G, IT)	
FE421	1-236-462-11	ENCAPSULATED COMPONENT	
FE451	1-236-463-11	ENCAPSULATED COMPONENT	
		< IC >	
IC221	8-759-812-35	IC LA1235	
IC251	8-759-812-35	IC LA1235	
IC252	8-759-145-58	IC UPC4558C	
IC301	8-759-801-80	IC LA3401	
IC302	8-759-145-58	IC UPC4558C	
IC401	8-759-812-45	IC LA1245	
IC501	8-759-175-87	IC LC7218-ST	
IC601	8-759-265-43	IC uPD78014GC-591-AB8	
IC801	8-759-065-98	IC SAA6579T	
IC901	8-759-820-09	IC LA5667	
		< COIL >	
L351	1-410-971-11	INDUCTOR 10uH (G, IT)	
L352	1-410-971-11	INDUCTOR 10uH (G, IT)	
L451	1-410-979-11	INDUCTOR 220uH	
L601	1-410-977-11	INDUCTOR 100uH	
		< FILTER >	
LPF301	1-235-164-00	FILTER, LOW PASS	
LPF302	1-235-164-00	FILTER, LOW PASS	
		< TRANSFORMER >	
⚠PT901	1-423-525-11	TRANSFORMER, POWER	
		< TRANSISTOR >	
Q151	8-729-904-39	TRANSISTOR DTC114TS	
Q152	8-729-904-39	TRANSISTOR DTC114TS	
Q201	8-729-230-XX	TRANSISTOR 2SC2669OY-TPE4	
Q202	8-729-230-XX	TRANSISTOR 2SC2669OY-TPE4	
Q203	8-729-230-XX	TRANSISTOR 2SC2669OY-TPE4	
Q204	8-729-230-XX	TRANSISTOR 2SC2669OY-TPE4	
Q231	8-729-904-39	TRANSISTOR DTC114TS	
Q232	8-729-904-39	TRANSISTOR DTC114TS	
Q233	8-729-904-39	TRANSISTOR DTC114TS	
Q234	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q235	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q236	8-729-230-XX	TRANSISTOR 2SC2669OY-TPE4	
Q237	8-729-230-XX	TRANSISTOR 2SC2669OY-TPE4	
Q251	8-729-230-XX	TRANSISTOR 2SC2669OY-TPE4	
Q301	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q302	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q401	8-729-230-XX	TRANSISTOR 2SC2669OY-TPE4	
Q451	8-729-231-20	TRANSISTOR 2SK161-YGR	
Q452	8-729-900-89	TRANSISTOR DTC144ES	
Q453	8-729-900-89	TRANSISTOR DTC144ES	
Q454	8-729-900-89	TRANSISTOR DTC144ES	
Q455	8-729-900-89	TRANSISTOR DTC144ES	
Q456	8-729-900-89	TRANSISTOR DTC144ES	
Q457	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q458	8-729-904-39	TRANSISTOR DTC114TS	
Q459	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q511	8-729-202-67	TRANSISTOR 2SK246-GR3	
Q512	8-729-201-84	TRANSISTOR 2SC3112-B	
Q521	8-729-900-89	TRANSISTOR DTC144ES	
Q522	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q523	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q551	8-729-202-67	TRANSISTOR 2SK246-GR3	
Q552	8-729-201-84	TRANSISTOR 2SC3112-B	
Q610	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q901	8-729-900-65	TRANSISTOR DTA144ES	
		< RESISTOR >	
⚠R101	1-249-401-11	CARBON 47 5% 1/4W F	
R151	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R152	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R153	1-216-020-00	METAL GLAZE 62 5% 1/10W	
R154	1-216-020-00	METAL GLAZE 62 5% 1/10W	
R155	1-216-005-00	METAL CHIP 15 5% 1/10W	
R156	1-216-023-00	METAL CHIP 82 5% 1/10W	
R157	1-216-023-00	METAL CHIP 82 5% 1/10W	
R201	1-216-037-00	METAL CHIP 330 5% 1/10W	
R202	1-216-001-00	METAL CHIP 10 5% 1/10W	
R203	1-216-037-00	METAL CHIP 330 5% 1/10W	
R204	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R205	1-216-035-00	METAL CHIP 270 5% 1/10W	
R206	1-216-041-00	METAL CHIP 470 5% 1/10W	
R207	1-216-037-00	METAL CHIP 330 5% 1/10W	
R208	1-216-083-00	METAL CHIP 27K 5% 1/10W	
R209	1-216-037-00	METAL CHIP 330 5% 1/10W	
R210	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R211	1-216-035-00	METAL CHIP 270 5% 1/10W	
R212	1-216-037-00	METAL CHIP 330 5% 1/10W	
R213	1-216-083-00	METAL CHIP 27K 5% 1/10W	
R214	1-216-037-00	METAL CHIP 330 5% 1/10W	
R221	1-216-037-00	METAL CHIP 330 5% 1/10W	
⚠R222	1-249-405-11	CARBON 100 5% 1/4W F	
R223	1-216-101-00	METAL CHIP 150K 5% 1/10W	
R231	1-216-037-00	METAL CHIP 330 5% 1/10W	
R232	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R233	1-216-037-00	METAL CHIP 330 5% 1/10W	
R234	1-216-005-00	METAL CHIP 15 5% 1/10W	

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Replace only with part number specified.

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Ref. No.	Part No.	Description				Remark
R235	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R236	1-216-033-00	METAL CHIP	220	5%	1/10W	
R237	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R238	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R239	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R240	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R241	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R242	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R243	1-216-025-00	METAL CHIP	100	5%	1/10W	
⚠R244	1-249-393-11	CARBON	10	5%	1/4W	F
⚠R245	1-249-393-11	CARBON	10	5%	1/4W	F
⚠R246	1-249-393-11	CARBON	10	5%	1/4W	F
R251	1-216-037-00	METAL CHIP	330	5%	1/10W	
R252	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R253	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R254	1-216-001-00	METAL CHIP	10	5%	1/10W	(AEP, EE)
R254	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	(G, IT)
R255	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R256	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R257	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R258	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
⚠R259	1-249-405-11	CARBON	100	5%	1/4W	F
R260	1-216-091-00	METAL CHIP	56K	5%	1/10W	
R261	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R262	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R264	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
⚠R265	1-249-401-11	CARBON	47	5%	1/4W	F
R268	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R269	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R270	1-216-101-00	METAL CHIP	150K	5%	1/10W	
R271	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R272	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R273	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R301	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R302	1-216-101-00	METAL CHIP	150K	5%	1/10W	
R303	1-216-101-00	METAL CHIP	150K	5%	1/10W	
R304	1-216-096-00	METAL CHIP	91K	5%	1/10W	
R305	1-216-096-00	METAL CHIP	91K	5%	1/10W	
R306	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R307	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R308	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R309	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R310	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R311	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R312	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R313	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R314	1-216-041-00	METAL CHIP	470	5%	1/10W	
R315	1-216-041-00	METAL CHIP	470	5%	1/10W	
⚠R316	1-249-401-11	CARBON	47	5%	1/4W	F
R317	1-216-043-00	METAL CHIP	560	5%	1/10W	
R318	1-216-043-00	METAL CHIP	560	5%	1/10W	
R319	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R320	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R324	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
⚠R325	1-249-401-11	CARBON	47	5%	1/4W	F
R361	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R362	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R370	1-216-001-00	METAL CHIP	10	5%	1/10W	
R401	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
⚠R402	1-249-409-11	CARBON	220	5%	1/4W	F
R404	1-216-041-00	METAL CHIP	470	5%	1/10W	
R405	1-216-025-00	METAL CHIP	100	5%	1/10W	
R406	1-216-023-00	METAL CHIP	82	5%	1/10W	
R408	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R409	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R410	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R411	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
⚠R412	1-247-811-31	CARBON	150	5%	1/4W	F
R413	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R414	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R415	1-216-101-00	METAL CHIP	150K	5%	1/10W	
R416	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R418	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R419	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R421	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R422	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R451	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R452	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R454	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R455	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R456	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R457	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R458	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R459	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R460	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R501	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R502	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R503	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
⚠R504	1-249-400-11	CARBON	39	5%	1/4W	F
⚠R505	1-249-408-11	CARBON	180	5%	1/4W	F
R506	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R507	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R508	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R511	1-216-043-00	METAL CHIP	560	5%	1/10W	
R512	1-216-043-00	METAL CHIP	560	5%	1/10W	
R513	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R514	1-216-037-00	METAL CHIP	330	5%	1/10W	
R515	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R516	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R517	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
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Ref. No.	Part No.	Description				Remark
R518	1-216-045-00	METAL CHIP	680	5%	1/10W	
R519	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R521	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R522	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R551	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R552	1-216-043-00	METAL CHIP	560	5%	1/10W	
R553	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R554	1-216-037-00	METAL CHIP	330	5%	1/10W	
R555	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R556	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R557	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R581	1-216-033-00	METAL CHIP	220		1/10W	
R582	1-216-049-00	METAL CHIP	1K		1/10W	
R602	1-216-073-00	METAL CHIP	10K	5%	1/10W	(EE)
R604	1-216-073-00	METAL CHIP	10K	5%	1/10W	(IT, EE)
R605	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R606	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R607	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R608	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R609	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R610	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R611	1-216-049-00	METAL CHIP	1K	5%	1/10W	
⚠R613	1-249-401-11	CARBON	47	5%	1/4W	F
R614	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R626	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R627	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R628	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R640	1-216-025-00	METAL CHIP	100	5%	1/10W	
R641	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R642	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R643	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R644	1-216-025-00	METAL CHIP	100	5%	1/10W	
R645	1-216-025-00	METAL CHIP	100	5%	1/10W	
R646	1-216-025-00	METAL CHIP	100	5%	1/10W	
R647	1-216-025-00	METAL CHIP	100	5%	1/10W	
R648	1-216-025-00	METAL CHIP	100	5%	1/10W	
R651	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R652	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
⚠R801	1-249-401-11	CARBON	47	5%	1/4W	F
R802	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
⚠R901	1-247-727-51	CARBON	10		1/2W	F
⚠R902	1-247-752-11	CARBON	1K	5%	1/2W	F
R903	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R904	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R905	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R906	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
		< VARIABLE RESISTOR >				
RV221	1-241-765-11	RES, ADJ, CARBON	22K			
RV231	1-241-763-11	RES, ADJ, CARBON	4.7K			
RV251	1-241-630-11	RES, ADJ, CARBON	10K			
RV301	1-241-768-11	RES, ADJ, CARBON	220K			
RV402	1-241-630-11	RES, ADJ, CARBON	10K			
		< RELAY >				
RY151	1-755-034-11	RELAY				
RY153	1-515-614-11	RELAY				
		< TRANSFORMER >				
T251	1-235-126-00	ENCAPSULATED COMPONENT (G, IT)				
T252	1-404-845-11	COIL, DISCRI (PRIMARY)				
T253	1-404-846-11	COIL, DISCRI (SECONDARY)				
T401	1-404-713-11	TRANSFORMER, IF				
		< TERMINAL >				
* TM101	1-537-406-11	TERMINAL BOARD (ANT) (ANTENNA)				
		< TEST PIN >				
* TP251	1-565-513-11	PIN, CONNECTOR 2P				
* TP601	1-565-513-11	PIN, CONNECTOR 2P				
		< VIBRATOR >				
X501	1-577-126-21	VIBRATOR, CRYSTAL (7.2MHz)				
X601	1-760-403-21	VIBRATOR, CRYSTAL (8.4MHz)				
X801	1-579-900-21	VIBRATOR, CRYSTAL (4.332MHz)				
**********						
		MISCELLANEOUS				
		**********				
⚠19	1-575-651-21	CORD, POWER				
23	1-690-880-11	LEAD (WITH CONNECTOR)				
FL701	1-517-177-21	INDICATOR TUBE, FLUORESCENT				
⚠PT901	1-423-525-11	TRANSFORMER, POWER				
**********						
		ACCESSORIES & PACKING MATERIALS				
		**********				
	1-501-374-11	ANTENNA, LOOP				
	1-501-594-11	ANTENNA (FM) (AEP, EE)				
	1-558-271-11	CORD, CONNECTION (AUDIO 108cm)				
	1-765-383-11	CORD (WITH CONNECTOR) (EON)				
	3-758-928-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE) (AEP)				
	3-758-928-41	MANUAL, INSTRUCTION (GERMAN, DUTCH, SWEDISH, ITALIAN) (AEP, IT)				
	3-758-928-51	MANUAL, INSTRUCTION (GERMAN) (G)				
	3-758-928-71	MANUAL, INSTRUCTION (ENGLISH, POLISH, RUSSIAN) (EE)				
*	4-966-660-01	INDIVIDUAL CARTON				
*	4-966-661-01	CUSHION				

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref.No.	Part No.	Description	Remark	Ref.
**********				
		**********		
		HARDWARE LIST		
		**********		
#1	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3		
#2	7-682-548-04	SCREW +BVTT 3X8 (S)		
#3	7-682-548-09	SCREW +B 3X8		

9-959-628-11

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